Accordingly, the above amendment revises Claim 17 to depend from Claim 15. It is believed that the foregoing overcomes all of the rejections under 35 USC 112.

With respect to rejections based on prior art, Claims 1-7, 9-16, 18 and 19 are rejected under 35 USC 102(b) as anticipated by US Patent No. 5,735,171 to Moote et al. As described in the present application from page 1, line 28 through page 2, line 2, a windshield wiper arm for a vehicle mounts to a pivot shaft which pivotally reciprocates the wiper arm across the surface of a windshield. A problem with this arrangement is that the pivot shaft is susceptible to external impacts and loads as it protrudes from the surface of the vehicle body for attachment of the wiper arm thereto.

An advantage of the presently claimed invention is that it provides a wiper pivot unit that can absorb thrust loads applied to the pivot shaft thereof. As described from page 15, line 5, when a thrust load exceeding a predetermined value acts upon the pivot shaft, the pivot shaft shifts downward. Referring to Fig. 1 of the present application, the claimed invention accomplishes this by providing a pivot shaft (3) having a large diameter section (32) and a small diameter section (31). Thus, when a thrust load of predetermined force acts upon the pivot shaft (3), the pivot shaft is able to shift downward to avoid damage caused by excessive force being applied to the pivot shaft.

In contrast, Moote discloses a pivot joint (70) as shown in

Fig. 3 of the patent, for eliminating the need for multiple shims or bearing washers (38) or (66) as shown in Figs. 1 and 2 *of* the Moote patent (Col. 4, lines 12-16). For this purpose, Moote teaches at Col. 4, lines 33-42, "retainer clip means 94". According to Moote, the retainer clip means (94) maintains (emphasis added):

> a fixed dimensional relationship between the rotatable shaft 74, the housing 72 and the rotatable lever 86 so as ***to prevent axial movement*** of the housing 72 with respect to the shaft 78 and/or lever the lever 86.

This is directly contrary to the claimed invention. Moote does not provide for axial movement upon application of a predetermined force, and thus the arrangement is susceptible to damage.

In addition, the above amendment revises Claim 1 to more clearly define and distinguish over the prior art. As amended, Claim 1 in pertinent part recites:

> that when a thrust load of a predetermined value or more is applied to the pivot shaft toward the proximal end ... the pivot shaft starts moving with respect to the bearing portion, the locking member is moved to the small-diameter section, the frictional force

> is reduced, and the thrust load required to move the pivot shaft is reduced to substantially half of the thrust load that *is* required to start moving the pivot shaft with respect to the bearing portion.

There is no teaching or suggestion in Moote of this recitation in Claim 1 as amended. As noted above, Moote teaches away from the claimed invention in preventing axial movement. If there was significant axial movement in Moote, it would be due to failure of the device and there is no suggestion or teaching that the required thrust load for movement would be reduced to substantially half of the thrust load that is required for the start of movement.

Accordingly, it is believed that the amendment overcomes the 102(b) rejection of Claim 1 based on Moote. The same is submitted to be true for Claims 6 and 10 as the amendment cancels both of these claims, and Claims 2-5, 7, 9, and 11 as these claims all depend from Claim 1.

The above amendment revises Claim 12, in pertinent part, to recite that:

> the diameter of the large-diameter section and the inside diameter of the toothed washer before it is fitted to the pivot shaft are designed to allow the toothed washer to give a kinetic frictional force of substantially half

of a maximum static friction to be exhibited when the restriction of axial movement of the pivot shaft is canceled to allow the pivot shaft to shift with respect to the bearing portion

There is no teaching or suggestion in the cited art meeting the foregoing recitation. Hence, it is respectfully submitted that the amendment overcomes the 102(b) rejection of Claim 12 based on Moote. Likewise, the same is submitted to be true for Claim 18 as Claim 18 is cancelled, and for Claims 13-17 and 19 as these claims all depend directly or indirectly from Claim 12.

The Office Action additionally rejects claims under 35 USC 102(b) as being anticipated by Japanese Publication No. 09150714, which is the publication of Japanese Application No. 07310800, listing Setsuji et al. as inventors. Specifically, Claims 1-6, 8-15 and 17-19 are rejected as anticipated by Setsuji et al.

It is respectively submitted that the above amendment overcomes the 102(b) rejections based on Setsuji et al., for the same reasons discussed in connection with Moote. In particular, there is no suggestion in the cited art of a reduction in friction force by substantially half.

In addition, Claims 7 and 16 are rejected under 35 USC 103 as obvious over Setsuji. However, Claims 7 and 16 respectively depend from Claims 1 and 12. Accordingly, Claims 7 and 16 distinguish over

the cited art for the same reasons as Claims 1 and 12. Thus, the amendment also overcomes the obviousness rejection of Claims 7 and 16.

Finally, the amendment adds new Claims 20-29, which are submitted to all distinguish over the cited art.

New independent claim 20 requires an O-ring (7) which is shown in Figs. 1-4. The O-ring functions as a waterproof seal which seals between the pivot shaft and the pivot holder. Further, the O-ring allows deformation **of the locking** piece when a thrust force is applied to the pivot shaft.

More specifically, when a thrust load is applied to the pivot shaft, the pivot shaft starts moving, the locking piece of the locking member rubs against the pivot shaft, the locking piece is deformed, and the deformation of the locking pieces causes elastic deformation of the O-ring. In other words, the deformation of the locking pieces is received by the elastic deformation of the O-ring. Accordingly, the deformation of the locking member and friction between the pivot shaft and the locking member are stably controlled by the O-ring. If the O-ring is omitted, the locking member would be deformed by the axial movement of the pivot shaft and would be pulled down into the gap between the pivot shaft and the pivot holder. This would cause unstable friction. Accordingly, it is hopeless to control a thrust force that is required to move the pivot shaft. None of the cited references suggest or teach such O-ring.

CONCLUSION

In light of the foregoing, Applicant submits that the application is in condition for allowance. If the Examiner believes the application is not in condition for allowance, Applicant respectfully requests that the Examiner contact the undersigned attorney if it is believed that such contact will expedite the prosecution of the application.

Respectfully submitted,

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Attachment "A"
(Specification Amendment)

Please amend the specification paragraph at page 16, lines 10-20, as follows:

Fig. 7 shows a graph of displacement vs. load in the second embodiment. According to this graph, a load of about 2400 N corresponding to the maximum static friction is temporarily required when the toothed washer 5 starts shifting from the large-diameter section 32 of the pivot shaft 3 (more specifically from the thrust restricting ~~porision~~ portion). Once the toothed washer 5 shifted to the small-diameter section 31, the load drops suddenly, and the toothed washer 5 is allowed to move smoothly with a load of half as much as or less (about 980 N to about 1176 N) than that at the thrust restricting ~~porision~~ portion.

Attachment "B"
~~(Pending Claims)~~

1. (Currently amended) A wiper pivot unit comprising:

a pivot shaft having a proximal end and a distal end to which a wiper arm is fixed;

a pivot holder fixed to a vehicle body;

a bearing portion formed in the pivot holder and rotatably supporting the pivot shaft; and

a locking member for restricting axial movement of the pivot shaft with respect to the bearing portion, wherein the pivot shaft includes a small-diameter section formed over a predetermined length from the distal end side, and a large-diameter section, which has a diameter larger than that of the small-diameter section, formed on the proximal end side, the large-diameter section having an end portion in the proximity of the small-diameter section, wherein the locking member is engaged with a predetermined frictional force against an external surface at the end portion of the large-diameter section, wherein when a thrust load of a predetermined value or more is applied to the pivot shaft toward the proximal end, restriction of axial movement of the pivot shaft by the locking member is removed, the pivot shaft ~~is moved~~ starts moving with respect to the bearing portion, the locking member is moved to the small-diameter section, [[and]] the frictional force is reduced, and the thrust load required to move the pivot shaft is reduced to substantially half of the thrust load that is required to start moving the

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pivot shaft with respect to the bearing portion.

2. (Original) The wiper unit according to claim 1, wherein the predetermined frictional force is a result of a constricting force of the locking member against the outer surface of the pivot shaft.

3. (Original) The wiper pivot unit according to claim 1, wherein the small-diameter section protrudes entirely from the bearing portion and the large-diameter section is located in the bearing portion in the state where the locking member restricts axial movement of the pivot shaft with respect to the bearing portion.

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4. (Original) The wiper pivot unit according to claim 1, wherein the small-diameter section has a constant diameter along the axis of the pivot shaft and protrudes from the bearing portion.

5. (Currently amended) The wiper pivot unit according to claim 1, wherein the pivot shaft further has a fixing section for fixing the wiper arm at the distal end side [[than]] of the small-diameter section, wherein the small-diameter section is formed over a predetermined length between the fixing section and the large-diameter section.

6. (Cancelled)

7. (Original) The wiper pivot unit according to claim 1, wherein the pivot shaft has a tapered surface, which connects the large-diameter section and the small-diameter section.

8. (Original) The wiper pivot unit according to claim 5, wherein the fixing section has a tapered rotation preventing portion having a knurled surface and a threaded portion formed on the distal end side of the rotation preventing portion.

B2 9. (Currently amended) The wiper pivot unit according to claim 1, wherein the locking member includes a ring-shaped toothed washer having a plurality of locking pieces protruding inward, the locking pieces defining a through hole, wherein the diameter of the small-diameter section, the diameter of the large-diameter section and the inside diameter of the through hole of the toothed washer before it is fitted to the pivot shaft are designed to produce a kinetic frictional force between the toothed washer and the small-diameter section of substantially half ~~as much as or less than~~ of a maximum static friction to that occurs when the toothed washer constricts the large-diameter section.

10. (Cancelled)

11. (Original) The wiper pivot unit according to claim 1, wherein the locking member includes a toothed washer having a plurality of locking pieces protruding inward, wherein the washer has an unsevered ring shape.

12. (Currently amended) A wiper pivot unit comprising:

a pivot shaft having a proximal end and a distal end to which a wiper arm is fixed;

a pivot holder fixed to a vehicle body;

a bearing portion formed in the pivot holder to support rotatably the pivot shaft; and

B2 a locking member for restricting axial movement of the pivot shaft with respect to the bearing portion, wherein the pivot shaft includes a small-diameter section formed over a predetermined length from the distal end side, and a large-diameter section, which has a diameter larger than that of the small-diameter section, formed on the proximal end side, the large-diameter section having an end portion in the proximity of the small-diameter section, wherein the locking member includes a toothed washer having a plurality of locking pieces protruding inward, tips of the locking pieces defining a through hole, and the toothed washer is engaged with the outer surface at the end portion of the large-diameter section to constrict that portion with a predetermined constricting force, and wherein the diameter of the small-diameter section, the diameter of the large-diameter section and the inside diameter of the toothed washer before it

is fitted to the pivot shaft are designed to allow the toothed washer to give a kinetic frictional force of substantially half ~~as much as or less than~~ of a maximum static friction to be exhibited when the restriction of axial movement of the pivot shaft is canceled to allow the pivot shaft to shift with respect to the bearing portion.

13. (Original) The wiper pivot unit according to claim 12, wherein the small-diameter section protrudes entirely from the bearing portion and the large-diameter section is located in the bearing portion in the state where the locking member restricts axial movement of the pivot shaft.

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14. (Original) The wiper pivot unit according to claim 12, wherein the small-diameter section has a constant diameter along the axis of the pivot shaft and protrudes from the bearing portion.

15. (Currently amended) The wiper pivot unit according to claim 12, wherein the pivot shaft further has a fixing section for fixing the wiper arm at the distal end side [[than]] of the small-diameter section, wherein the small-diameter section is formed over a predetermined length between the fixing section and the large-diameter section.

16. (Original) The wiper pivot unit according to claim 12,

wherein the pivot shaft has a tapered surface, which connects the large-diameter section and the small-diameter section.

17. (Currently amended) The wiper pivot unit according to claim [[16]] 15, wherein the fixing section has a tapered rotation preventing portion having a knurled surface and a threaded portion formed on the distal end side of the rotation preventing portion.

18. (Cancelled)

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19. (Original) The wiper pivot unit according to claim 12, wherein the locking member includes a toothed washer having a plurality of locking pieces protruding inward, wherein the washer has an unsevered ring shape.

20. (New) A wiper pivot unit comprising:

a pivot shaft having an outer surface, a proximal end, and a distal end to which a wiper arm is fixed, wherein the pivot shaft includes a small-diameter section formed over a predetermined length from the distal end side, and a large-diameter section, which has a diameter larger than that of the small-diameter section, formed on the proximal end side, the large-diameter section having an end portion in the proximity of the small-diameter section;

a pivot holder fixed to a vehicle body;

a bearing portion formed in the pivot holder and rotatably supporting the pivot shaft and having a proximal end, a distal end, and an inner surface which faces the outer surface of the pivot shaft;

an O-ring located between the inner surface of the bearing portion and the outer surface of the pivot shaft at the distal end of the bearing portion for waterproofing; and

a locking member located at the distal end of the bearing portion for restricting axial movement of the pivot shaft with respect to the bearing portion and having a locking piece,

B2 wherein the locking piece constricts an external surface at the end portion of the large-diameter section so that the locking member is engaged with a predetermined frictional force against the large-diameter section, wherein when a thrust load of a predetermined value or more is applied to the pivot shaft toward the proximal end, the O-ring is elastically deformed to allow deformation of the locking piece, restriction of axial movement of the pivot shaft by the locking member is removed, the pivot shaft is moved with respect to the bearing portion, the locking member is moved to the small-diameter section, and the frictional force is reduced.

21. (New) The wiper pivot unit according to claim 20, wherein the small-diameter section protrudes entirely from the bearing portion and the large-diameter section is located in the bearing portion in the state where the locking member restricts

axial movement of the pivot shaft with respect to the bearing portion.

22. (New) The wiper pivot unit according to claim 20, wherein the small-diameter section has a constant diameter along the axis of the pivot shaft and protrudes from the bearing portion.

23. (New) The wiper pivot unit according to claim 20, wherein the pivot shaft further has a fixing section for fixing the wiper arm at the distal end side of the small-diameter section, wherein the small-diameter section is formed over a predetermined length between the fixing section and the large-diameter section.

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24. (New) The wiper pivot unit according to claim 20, wherein the locking member includes a toothed washer having inwardly protruding teeth and the locking piece is one of the inwardly protruding teeth, wherein tips of the teeth define a through hole, and the small-diameter section has a diameter smaller than the inside diameter of the through hole of the toothed washer before it is fitted to the pivot shaft.

25. (New) The wiper pivot unit according to claim 20, wherein the pivot shaft has a tapered surface, which connects the large-diameter section and the small-diameter section.

26. (New) The wiper pivot unit according to claim 23, wherein the fixing section has a tapered rotation preventing portion having a knurled surface and a threaded portion formed on the distal end side of the rotation preventing portion.

27. (New) The wiper pivot unit according to claim 20, wherein the locking member includes a ring-shaped toothed washer having inwardly protruding teeth which define a through hole and the locking piece is one of the teeth, wherein the diameter of the small-diameter section, the diameter of the large-diameter section and the inside diameter of the through hole of the toothed washer before it is fitted to the pivot shaft are designed to produce a kinetic frictional force between the toothed washer and the small-diameter section of half as much as or less than a maximum static friction to that which occurs when the toothed washer constricts the large-diameter section.

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28. (New) The wiper pivot unit according to claim 20, wherein the locking member includes a toothed washer having inwardly protruding teeth and the locking piece is one of the teeth, wherein the washer has an unsevered ring shape.

29. (New) A wiper pivot unit comprising:

a pivot shaft having an outer surface, a proximal end, and a distal end to which a wiper arm is fixed, wherein the pivot shaft

includes a small-diameter section formed over a predetermined length from the distal end side, and a large-diameter section, which has a diameter larger than that of the small-diameter section, formed on the proximal end side, the large-diameter section having an end portion in the proximity of the small-diameter section;

a pivot holder fixed to a vehicle body;

a bearing portion formed in the pivot holder and rotatably supporting the pivot shaft and having a proximal end, a distal end, and an inner surface which faces the outer surface of the pivot shaft; and

a locking member for restricting axial movement of the pivot shaft with respect to the bearing portion, wherein the locking member is engaged with a predetermined frictional force against an external surface at the end portion of the large-diameter section, wherein when a thrust load of a predetermined value or more is applied to the pivot shaft toward the proximal end, the locking member allows to start axially moving the pivot shaft with respect to the bearing portion, and wherein when the locking member meets with the small diameter section, the thrust load required to move the pivot shaft is reduced by substantially half of the predetermined value.